



Doc Code: AP.PRE.REQ

PTO/SB/33 (07/05)

Approved for use through xx/xx/200x. OMB 0651-00xx
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PRE-APPEAL BRIEF REQUEST FOR REVIEW		Docket Number (Optional) ITL.1012US (P16648)
<p>I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR</p> <p>on <u>November 6, 2007</u></p> <p>Signature </p> <p>Typed or printed name <u>Nancy Meshkoff</u></p>		<p>Application Number 10/629,262</p> <p>Filed July 29, 2003</p> <p>First Named Inventor Anders Grunnet-Jepsen</p> <p>Art Unit 2874</p> <p>Examiner Jerry T. Rahill</p>
<p>Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.</p> <p>This request is being filed with a notice of appeal.</p> <p>The review is requested for the reason(s) stated on the attached sheet(s).</p> <p>Note: No more than five (5) pages may be provided.</p>		
<p>I am the</p> <p><input type="checkbox"/> applicant/inventor.</p> <p><input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)</p> <p><input checked="" type="checkbox"/> attorney or agent of record. Registration number <u>28,994</u></p> <p><input type="checkbox"/> attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____</p>		
<p> Signature</p> <p>Timothy N. Trop Typed or printed name</p> <p>(713) 468-8880 Telephone number</p> <p>November 6, 2007 Date</p>		
<p>NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.</p>		
<p><input type="checkbox"/> *Total of _____ forms are submitted.</p>		

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant:

Anders Grunnet-Jepsen et al. § Art Unit: 2874
Serial No.: 10/629,262 § Examiner: Jerry T. Rahll
Filed: July 29, 2003 § Docket: ITL.1012US
For: Segmented Waveguide § P16648
Coupler § Assignee: Intel Corporation

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

STATEMENT IN SUPPORT OF PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sir:

Claim 1 is as follows (with references to Figure 1 in parentheses):

1. A planar light wave circuit comprising:
a substrate;
a pair of waveguides (14, 16) formed on said substrate; and
a coupling region (12a, 12b) formed between said waveguides, at
least one of said waveguides being segmented in said coupling region.

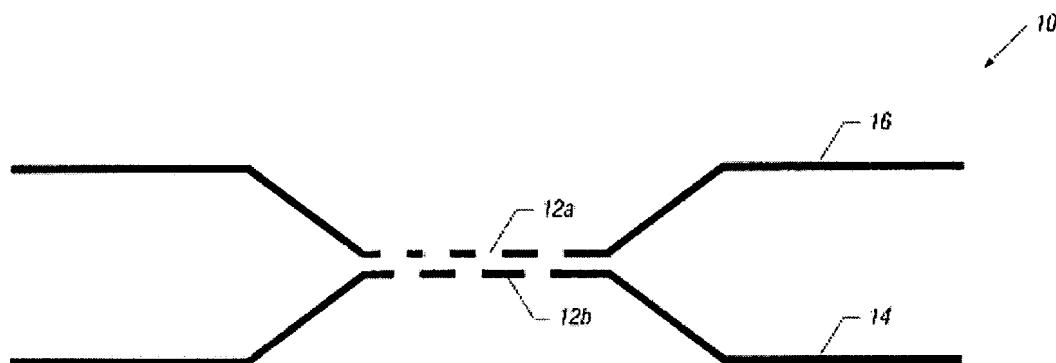


FIG. 1

Date of Deposit: November 6, 2007

I hereby certify under 37 CFR 1.8(a) that this correspondence is being deposited with the United States Postal Service as **first class mail** with sufficient postage on the date indicated above and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.


Nancy Meshkoff

The Examiner suggests that inherently a Bragg grating is segmented. This is simply untrue. *See Exhibit A.* Nonetheless, the final rejection is maintained, suggesting, again, that it is well known that Bragg gratings are segmented. The applicant has cited material which demonstrates this is untrue and, therefore, a substantial issue arises with respect to whether or not Bragg gratings are segmented. Particularly, Bragg gratings are written using UV light. Thus, there is no reason why they would be segmented because exposure to such light does not segment the waveguide.

Claim 3, for example, calls for one of the waveguides being segmented "by having at least two gaps along the length of the waveguide in the coupling region." The suggestion that nothing in the claims requires that gaps be empty of material is certainly surprising. One wonders what the Examiner believes a gap might be? There are no gaps or anything that could possibly be called a gap in the cited reference. There is simply a conventional Bragg grating with nothing added to it and nothing taken away from it. To suggest that this is segmented simply reads the word "segmented" out of the claim. Similarly, the suggestion that a gap could be simply an undifferentiated piece of material is to read a "gap" out of the claim. There is simply no basis for the maintenance of the rejection and reconsideration is respectfully requested.

The assertion that Snitzer describes a Bragg grating forming the segmented portions of the waveguides is certainly surprising since nothing in Snitzer ever mentions anything that is segmented. No support is ever provided for this assertion. In fact, no support is provided whatsoever that Snitzer is segmented. The assertion that the region 105 is segmented is unsupportable. It is simply a region which is written to by ultraviolet light. It is no way segmented any more than anything else in the waveguide. The assertion that "Snitzer describes a Bragg grating forming the segmented portions of waveguides" is without support. The assertion that "a Bragg grating inherently has at least two gaps formed therein" is completely unsupportable. In order to be inherent, it must necessarily be true. Since a Bragg grating is simply formed by exposure to ultraviolet light, there is no reason why a Bragg grating would be segmented or would have one gap, much less two gaps. Moreover, no reason has ever been provided.

The assertion of well known gaps in Bragg gratings should be supported and should have been supported by now. Despite the fact that the applicant has shown that this is not the case the position has been maintained. Reconsideration should be undertaken.

Claim 4 calls for gaps that are irregularly sized. From the total absence of any teaching of a gap, the Examiner, nonetheless, rejects claims that call for specifically configured gaps. There is no basis for such a rejection.

Similarly, claim 5 calls for regularly sized along the length of the coupling region. Not only does the reference not show one gap, it does not show two gaps, and it tells nothing about any gaps whatsoever and, therefore, cannot teach the specific feature of the size of the gaps.

In sum, a rejection is based on a reference which teaches not one thing that is pertinent to the claimed invention. As a result, the rejection cannot be sustained and should be reconsidered.

Respectfully submitted,



Timothy N. Trop, Reg. No. 28,994
TBOP, PRUNER & HU, P.C.
1616 S. Voss Road, Suite 750
Houston, TX 77057
713/468-8880 [Phone]
713/468-8883 [Fax]

Attorneys for Intel Corporation

EXHIBIT A

Fiber-Optic Communications Technology

DJAFAR K. MYNBAEV

New York City Technical College of the City University of New York

LOWELL L. SCHEINER

Polytechnic University



Upper Saddle River, New Jersey
Columbus, Ohio

has a bandwidth of 0.2 nm; to get to 40 nm, one has to use a device about 1 m in length. (Such FBG devices have indeed been fabricated.)

There is a trade-off between an FBG's bandwidth and its delay, that is, its compensation ability. For example, suppose an FBG introduces a 1400-ps/nm delay. This number means the FBG can introduce, theoretically, a delay of 1400 ps/nm over a 1-nm bandwidth or a delay of 140 ps/nm over a 10-nm bandwidth.

Fabrication of an FBG In 1978, Canadian scientist Kenneth Hill discovered fortuitously that the refractive index of the core of a fiber can be changed under exposure to ultraviolet light. This phenomenon, called *fiber photosensitivity*, is the physical basis for grating fabrication. There are two basic fabrication methods today: The original one—directly exposing a fiber's core to a pair of interfering UV beams—provides radiation of both maximum and minimum intensity. The minimum intensity leaves the refractive index unchanged and the maximum intensity changes the refractive index.

Hill and his colleagues also developed a second fabrication method—the phase-mask technique. Based on essentially the same interference principle, it gives much better results because of the higher grating precision it imposes.

In general, then, FBGs are considered the most promising dispersion-compensation devices. There are already many commercially available types of chirped-fiber Bragg gratings, and these seem to represent the direction in which the industry is going. FBGs are well on their way to giving DCFs stiff competition ([3], [6]). You can get an idea what commercial level the characteristics of chirped-fiber Bragg gratings have reached today by looking at the following data of a modern FBG [7]: bandwidth—from 4 to 10 nm; dispersion—from -700 ps/nm to -1400 ps/nm; insertion loss < 4 dB; PMD < 4 ps; PDL < 0.25 dB, and return loss (see Chapter 8) > 50 dB. The unit can compensate for third-order dispersion. The physical dimension is $212 \times 155 \times 20$ mm.

Dispersion compensation is so important for long-haul systems that scientists continue to search for effective new solutions. Several competitive dispersion-compensating techniques are currently in the research stage.

Dispersion Compensation: The System Viewpoint

We have to keep in mind that we need to compensate for dispersion only for the purpose of increasing system bandwidth, or bit rate. But evaluation of dispersion-compensating devices should also take into account all other performance characteristics of a fiber-optic communications system. Let's consider dispersion compensation from the system standpoint.

In modern fiber-optic communications systems, dispersion—not loss—becomes the distance-limiting factor.

If we rearrange Formula 5.13 in such a way that

$$L_{\max} = 1/[4BR|D(\lambda)|\Delta\lambda], \quad (6.11)$$

we can calculate the maximum length of a fiber link limited by chromatic dispersion. Let's take these typical parameters: $D(\lambda) = 17$ ps/nm·km at $\lambda = 1550$ nm, $\Delta\lambda = 0.2$ nm, and $BR = 2.5$ Gbps. One finds L_{\max} (dispersion) = 29.4 km. Our calculations of loss-distance limitations in Example 5.2.1 showed L_{\max} (loss) = 73.12 km. These numbers give you an idea of how dispersion-distance and loss-distance limitations relate to each other.

It seems that with improved dispersion-compensating techniques, this problem could be overcome. For example, for a DSF fiber, $D(\lambda)$ is not more than 2.5 ps/nm·km, which gives $L_{\max} = 199.9$ km. Thus loss-distance limitation becomes the major restriction again. On the other hand, if one arranges the transmission of a high-power signal with in-line optical amplifiers, it looks as though the loss-distance limit disappears. In reality, however, both approaches do not allow us to achieve our goal. Pumping too much power into a fiber and working near a zero-dispersion wavelength cause other restrictions associated with nonlinear effects. These are discussed later in this chapter.